Guest Blog: Risk of summer drought no greater than average

Description

There have been some reports in the press that dry weather in May will bring a return of drought conditions.

Here Victoria Williams, Drought Advisor at the Environment Agency, explains what the risks currently are.

Every week we measure water resources in England to assess how dry the soils are and how much rain they can soak up, the amount of water flowing in rivers, stored below ground in aquifers and above ground in reservoirs, and the outlook for the coming months.

Our latest water situation report details a positive outlook for water resources in the coming months. 2012 was the second wettest year on record, and despite a relatively dry start to 2013, river levels are normal or above normal at the majority of our monitoring sites. We also look ahead by modelling how rivers and groundwaters may respond to different future rainfall patterns over the summer. The results shows a positive picture even if rainfall is below average and point to the risk of drought this summer being no greater than average.

However it is still as important as ever to use water wisely. If the weather does turn hot and dry there could be localised impacts on rivers and the environment. Modelling suggests that a changing climate could reduce some river flows by up to 80 per cent during the summer in the next 40 years – increasing the challenge of ensuring there is enough water for people, business, farmers and the environment.

Date Created
May 2013

April drier and colder than average

Description

After the wettest April on record in 2012, provisional full-month Met Office figures show this April has been slightly drier than average in the UK.

Rainfall throughout the UK was 64 mm this year, compared to the 1981-2010 average of 72.7 mm. That's considerably less than the 128 mm we saw last year.

There were big regional differences in April rainfall this year. Scotland saw 121.2 mm of rain which is above the 91.1 mm average and Northern Ireland saw 75.2mm, almost spot on the 75.0 mm average.

However, both England and Wales saw well below average rainfall. Wales had 50.3mm, compared to an average of 89.3mm, and England saw 30.4mm, compared to an average of 58.7 mm.

The month was characterised by generally cold and dry weather, following on from the theme set in March. Despite this, April registered as only slightly colder than average with a mean UK temperature of 6.3 °C, which is 1.1 °C below the 7.4 °C long-term average.

This is the same mean temperature as recorded in April 2012. To find a colder April than the last two years, you have to go back to 1989 – which saw a mean temperature of 5.5 °C.

Scotland saw the coldest temperatures compared to country specific averages, with a mean temperature of 4.8 °C, which is 1.3 °C below average – and is the same temperature as recorded in 1998.

The warmest day of the month was 25 April at Faversham in Kent when the temperature recorded was 23.1°C.

In terms of sunshine, Scotland was sunnier than the rest of the UK with hours of sunshine totalling 170.9, followed by Northern Ireland with 168.0, England at 167.7 and Wales at 162.7 hours.

This compares with only 127.9 hours of sunshine in April last year throughout the UK. The sunniest April in the last 10 years was 2007 with 203.5 hours.

	Mean Temperature		Sunshine hours		Rainfall	
Apr-13	Actual	Diff to Avg	Actual	Diff to Avg	Actual	Diff to Avg
	degC	degC	hours	%	mm	%
UK	6.3	-1.1	168.4	114	64	88
England	7.2	-0.9	167.7	108	30.4	52
Wales	6.4	-1.2	162.7	105	50.3	56
Scotland	4.8	-1.3	170.9	127	121.2	133

N Ireland	6.5	-1.1	168	115	75.2	100

Date Created
May 2013

May Bank Holiday Monday top temperatures so far

Description

The early May Bank Holiday Monday was fine with warm sunshine across much of the England and Wales and temperatures hitting the 20’s Celsius in many parts. However, as expected, sea fog did make for a misty day around some of the coast and Scotland and Northern Ireland saw a good deal of cloud with some rain in the northwest.

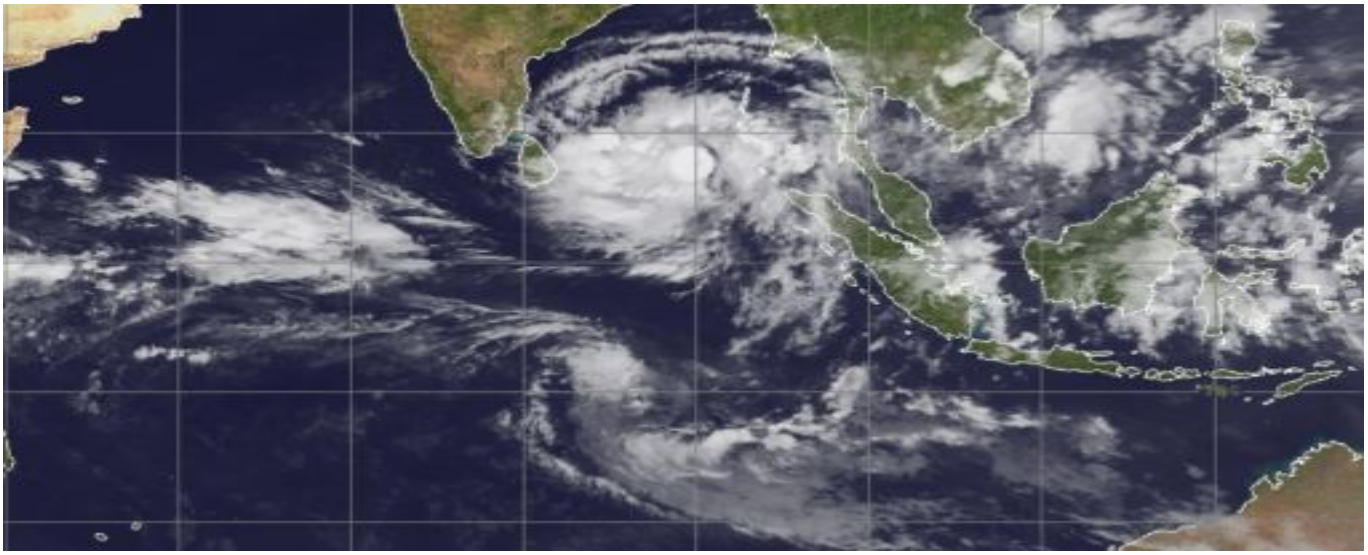
Here are the highest temperatures recorded so far today at Met Office observing stations:
Heathrow 22.0 C
Donna Nook 21.9 C
St James Park 21.7 C
Holbeach 21.6 C
Hull East Park 21.4 C
Northolt 21.3 C
Kew Gardens 21.3 C
Cambridge 21.2 C
Conningsby 21.1C
Sheffield 20.9C
Pershore 20.9 C
Gravesend 20.8 C

The highest temperature recorded so far this year was 23.1 C at Faversham on 25 April, and temperatures tomorrow may be on a par with that in some parts of central and eastern England.

Date Created
May 2013

Cyclone twins form in the Indian Ocean

Description



April to June each year usually sees the transition from the southern to the northern hemisphere tropical cyclone season.

During this time it is possible to see cyclones in both hemispheres simultaneously. Furthermore, cyclone ‘twins’ sometimes develop at approximately the same longitude either side of the equator.

For the first time since 2009 cyclone twins have developed in the Indian Ocean.

This was caused by a strong burst of westerly winds along the equator about a week ago. A large mass of clouds located in the same area initially moved eastwards with the wind.

The clouds furthest from the equator then started to curl northwards in the northern hemisphere and southwards in the southern hemisphere due to the earth’s rotation. Over time these cloud masses have consolidated and started to rotate to produce twin tropical storms.

The southern hemisphere storm has been named Jamala and is currently not expected to affect any land areas.

The northern hemisphere storm has been named Mahasen and there is a stronger likelihood of this making landfall next week on one of the Bay of Bengal’s coastal regions.

Regional warnings for Tropical Storm Jamala are produced by the Tropical Cyclone warning Centre at La Réunion in the South Indian Ocean.

Regional warnings for Tropical Storm Mahasen are produced by the Tropical Cyclone Warning Centre at New Delhi, India.

The Met Office routinely supplies predictions of cyclone tracks from its global forecast model to regional meteorological centres worldwide, which are used along with guidance from other models in the production of forecasts and guidance.

You can keep up to date with tropical cyclones around the world on our website or follow us on Twitter.

You can see the latest image of Tropical Storms Jamala and Mahasen at:

http://tropic.ssec.wisc.edu/real-time/indian/images/xxirm5bbm.jpg

Date Created
May 2013

The jet stream and why it’s too early to write-off summer

Description

There have been one or two stories in the press today saying we’re in for another washout summer, which would rightly inspire collective misery across the country.

However, it’s a far too early to be writing off any chance of a decent summer season – after all, it doesn’t officially start (for us meteorologists) for more than two weeks (on 1 June).

It appears the news stories are borne out of the current position of the jet stream, a band of fast moving westerly winds high up in the atmosphere. But why is this important?

A quick Jet stream explainer

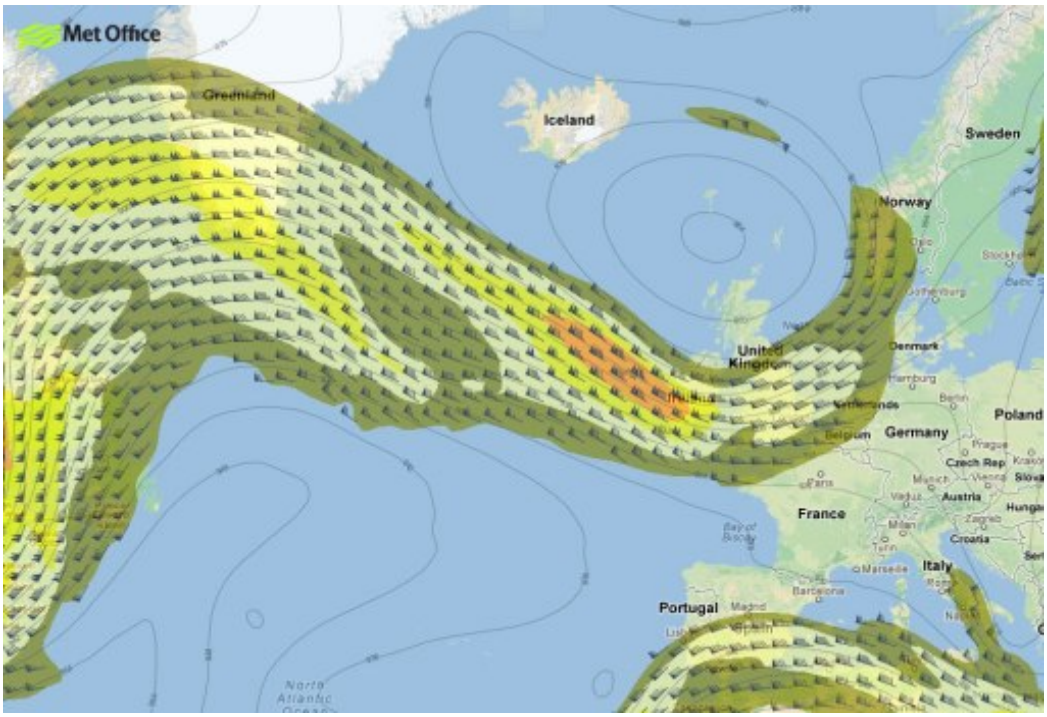
The jet stream tends to guide the generally wet and windy weather systems which come in off the Atlantic. So, if it’s over us or just to the south, we tend to get a lot of wet and windy weather – which is what we expect through winter.

If the jet is to the north of us, it guides that changeable weather to the north to give us more settled conditions – which is what we expect in the summer.

(You can read a bit more about the jet stream, how it impacted our weather last year, and any potential connections to climate change in a blog story we wrote last year).

What’s going on now?

Right now the jet stream is sitting to the south of the country and it is influencing the unsettled weather we are seeing at the moment.



Forecast chart showing position of the jet stream at midday on 13 May 2013

It's fair to say that this is roughly the position it was in for extended periods during the exceptionally wet weather that we saw last year, particularly in June.

Crucially, however, the jet stream does move around quite a bit and it can change its track significantly in just a few days. So the current position of the jet stream does not mean that it's stuck in that position.

Looking ahead

Much like our weather, it's a huge challenge to predict the exact track of the jet stream more than five or six days ahead, so there's still a great deal to play for in the outlook for our summer.

In short, it's far too early to write-off summer 2013 based on the current position of the jet stream.

To get the best information on what to expect you can see the latest detailed forecasts out to 5-days on our website, as well as a general view of what we expect out to 30 days.

You can find out more about the jet stream in our YouTube video.

Date Created
May 2013

What to do in heavy rain

Description

The next few days will see some heavy rain across the country resulting in possible disruption. Yellow alerts have been issued by the Met Office this week for many areas of the UK.

Met Office warnings and what they mean

If a yellow warnings is issued: Be aware.

During a yellow warning for rainfall there may be some minor traffic delays due to slower traffic and outdoor events may be disrupted or cancelled. There may be localised flooding of fields, car parks and recreational land.

When an amber warning is issued: Be prepared.

An amber warning indicates the need to be prepared for some disruption of daily routines and travel only if well prepared as the journey may take longer. Some flooding of homes, businesses and transport connections is possible. Utility services (gas, electricity and water) may also be affected and protecting property will be needed (for example moving possessions upstairs and using sandbags).

A red warning means action must be taken.

It is essential to follow advice from authorities under all circumstances and expect significant disruption. Only take journeys if absolutely essential and carry emergency food and clothing. Red warnings mean there could be widespread flooding of property and severe disruption to travel. There may be some loss of utilities (gas, electricity and water). There may be possible risk to life and the advice of the emergency services needs to be followed.

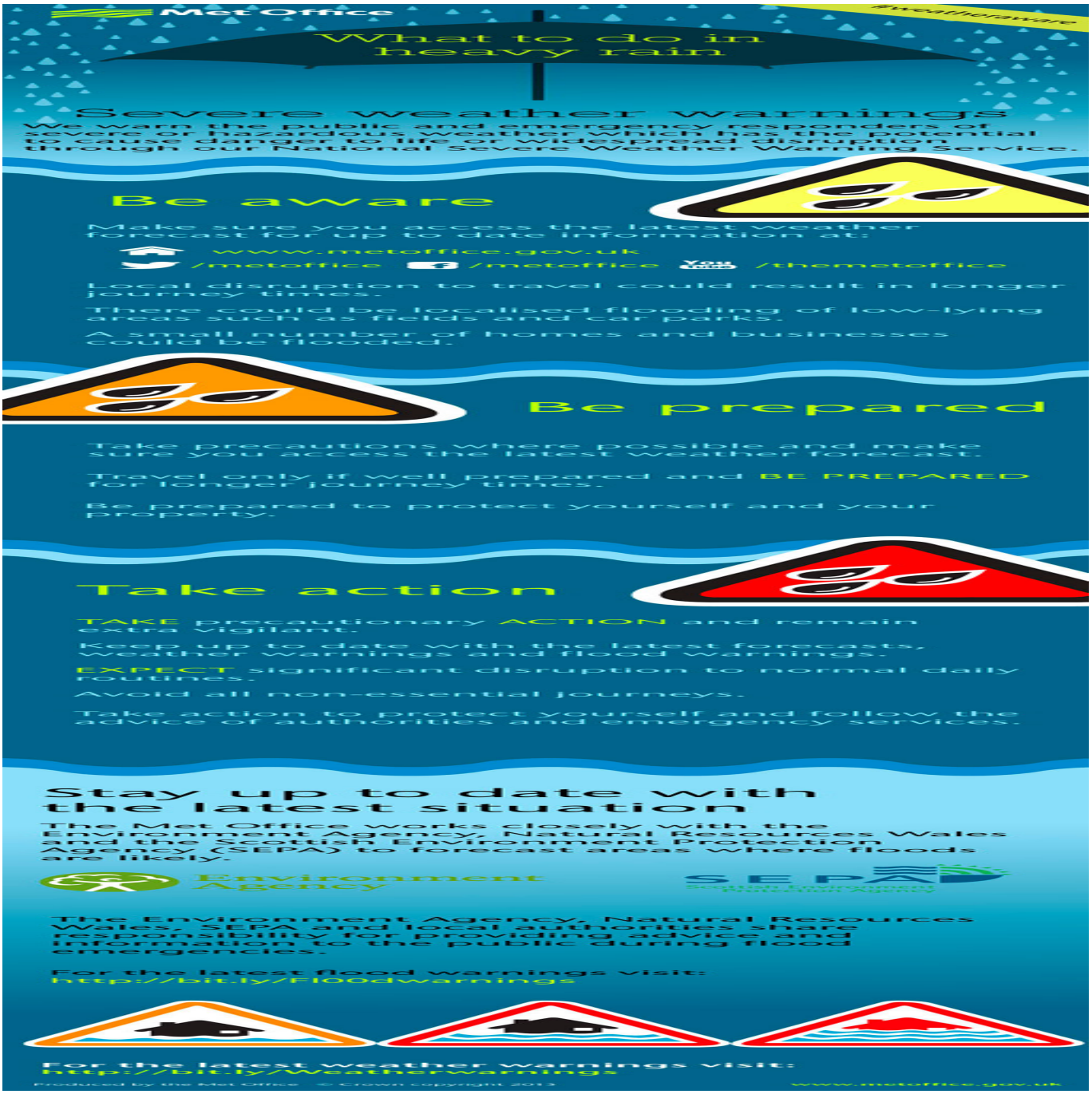
Check the latest forecast for your area on our severe weather page.

You can also sign up to our severe weather RSS feed or severe weather twitter account for your local area.

For more information on our severe weather warnings service, watch our video guide:

The Environment Agency's Floodline 0845 988 1188 is available 24 hours a day for flood advice or you can see the latest flood warnings on our website.

For more detailed travel information check the Highways Agency's website.

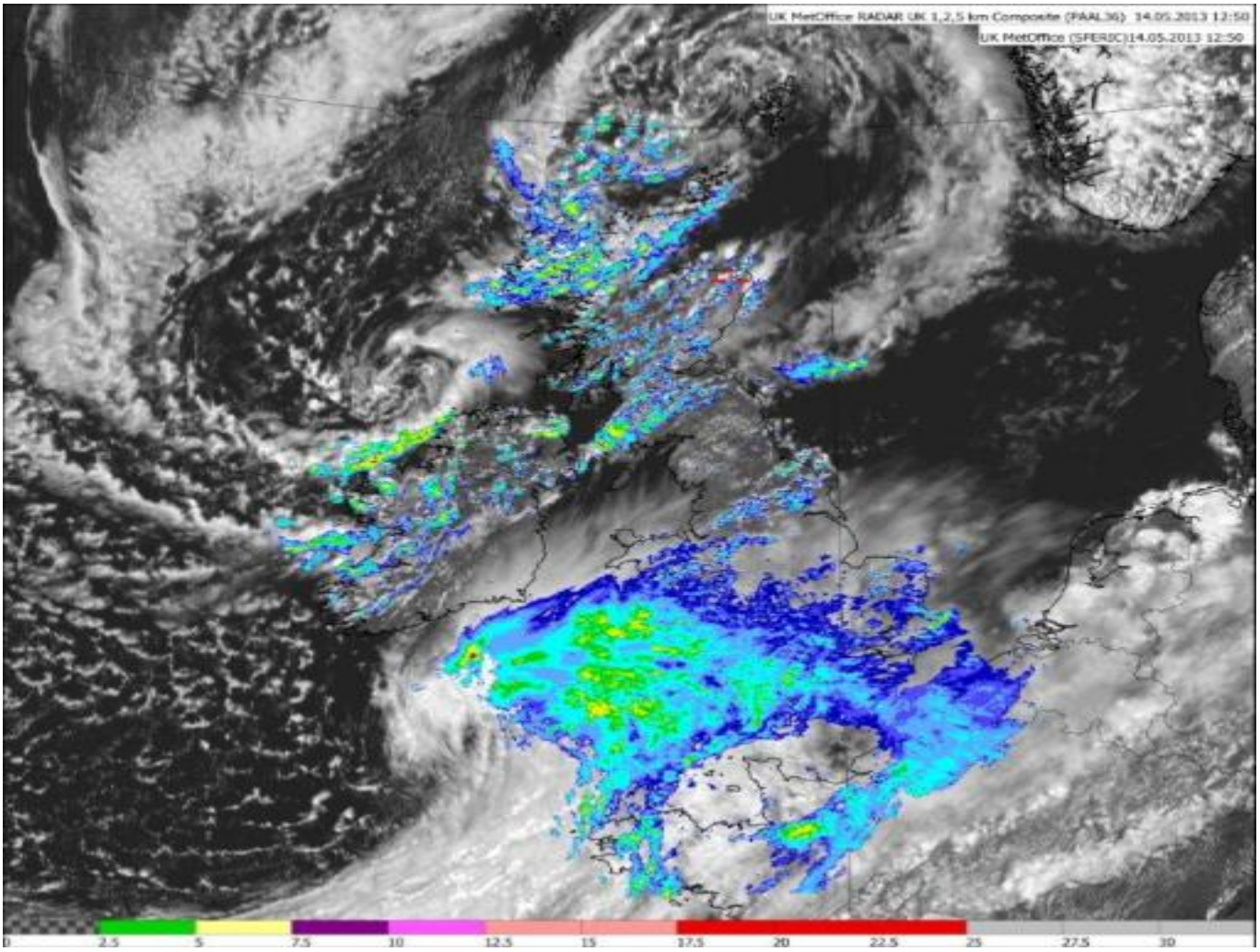

Met Office
#weatheraware
What to do in heavy rain
Severe Weather Warnings
We warn the public and emergency responders of severe or hazardous weather which has the potential to cause danger to life or widespread disruption through our National Severe Weather Warning Service.
Be aware
Make sure you access the latest weather forecast for up to date information at:
www.metoffice.gov.uk
/metoffice /metoffice /themetoffice
Local disruption to travel could result in longer journey times.
There could be localised flooding of low-lying areas such as fields and car parks.
A small number of homes and businesses could be flooded.
Be prepared
Take precautions where possible and make sure you access the latest weather forecast.
Travel only if well prepared and BE PREPARED for longer journey times.
Be prepared to protect yourself and your property.
Take action
TAKE precautionary ACTION and remain extra vigilant.
Keep up to date with the latest forecasts, Weather Warnings and Flood Warnings.
EXPECT significant disruption to normal daily routines.
Avoid all non-essential journeys.
Take action to protect yourself and follow the advice of authorities and emergency services.
Stay up to date With the latest situation
The Met Office works closely with the Environment Agency, Natural Resources Wales and the Scottish Environment Protection Agency (SEPA) to forecast areas where floods are likely.
Environment Agency
SEPA
The Environment Agency, Natural Resources Wales, SEPA and local authorities share responsibility for providing advice and information to the public during flood emergencies.
For the latest flood Warnings Visit:
http://bit.ly/Floodwarnings
For the latest weather Warnings visit:
http://bit.ly/Weatherwarnings
Produced by the Met Office © Crown copyright 2013
www.metoffice.gov.uk

Date Created
May 2013

Visible satellite image of triple lows over the UK

Description

This visible satellite and rainfall radar image shows the three areas of low pressure affecting the UK today.



We can see three low pressure areas showing up as swirls of cloud to the north of Scotland near Shetland, north of Northern Ireland and off south-west England. The centre of the lows show up as cloud free areas.

The low to the south west has developed quickly through today and will bring strong winds this evening to parts of Cornwall.

Keep up to date with forecasts and warnings for your local area on our website.

Date Created
May 2013

April weather summary video and your photos

Description

Following on from the second coldest March on record, April was another cool month, with temperatures below average everywhere. The provisional UK mean temperature was 6.3 °C, which is 1.1 °C below the 1981-2010 average, very similar to 2012 but otherwise the coldest April for the UK since 1989. Forecaster Helen talks through the weather we've seen this month in our video.

For a full written summary of the weather in April visit the climate section of our website.

Your weather pictures

Thank you for sharing your weather pictures with us on Twitter, here's some of our favourites.

> @metoffice April showers from Friday eve in Shropshire: flic.kr/p/ef8rDm
>
> — Rockwolf (@rockwolf74) April 29, 2013

> .@metoffice crazy skies, rain, sun and a rainbow in Islington in North London on Saturday. #weather twitter.com/andrew_spires/…
>
> — Andrew Spires (@andrew_spires) April 29, 2013

> @metoffice Mammatus over Frimley twitter.com/cambriangirl1/…
>
> — cambriangirl (@cambriangirl1) April 29, 2013

> @metoffice twitter.com/shaunys10/stat…
>
> — Shauny10 (@shaunys10) April 29, 2013

> @metoffice a wet day in the lakes looking for respite from wind and rain twitter.com/aimcourses/sta…
>
> — stuart smith (@aimcourses) April 29, 2013

> @metoffice Snowy Nith… twitter.com/vickimead/stat…
>
> — Victoria McNamara (@vickimead) April 29, 2013

Related articles

- March weather summary video and your photos (metofficenews.wordpress.com)

Date Created
May 2013

Met Office keeping a close eye on space weather

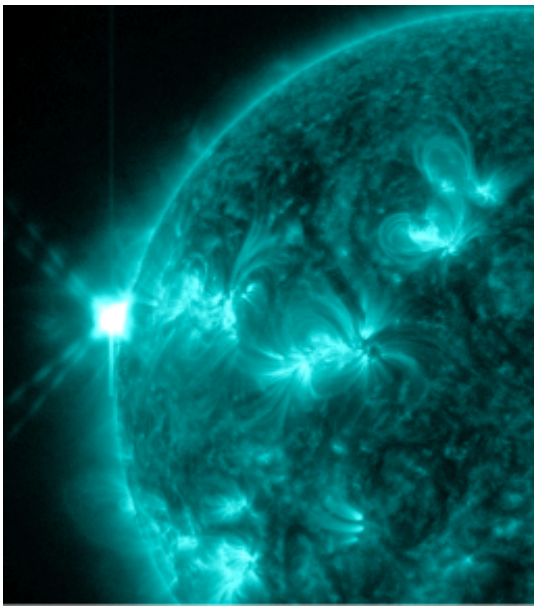
Description

The Met Office will be keeping a close eye on the Sun over the coming days after a recent surge in its activity.

It’s fairly common for eruptions from the Sun (often called “space weather”) to occur, and these are usually associated with sunspots – dark areas of intense activity on the surface of the star.

The eruptions from these spots come in several different forms, but if the events are of sufficient strength and directed towards the Earth, they can all cause impacts on our modern-day technology. Impacts range from minor interference to communication networks to temporary disruption to electricity supply, satellites and GPS navigation.

Over the past few days a sunspot, identified by the number 1748, has been the cause of many solar eruptions which have already caused some minor impacts.



NASA image showing one of the recent solar flares ejecting from sunspot 1748

Some of the eruptions have been in the form of Coronal Mass Ejections (CMEs), which are plumes of electromagnetically charged gas (plasma). These have been focused away from Earth so far, but, as the sun rotates, there is a chance the sunspot could emit a CME in our direction.

Mark Gibbs, Head of Space Weather at the Met Office, said: “If a strong CME were to be directed at Earth it could have some disruptive impacts, but at the moment the probability of this happening appears to be low.

“We’ll be keeping a close watch on the situation, particularly from Friday evening onwards, to advise on anything that could cause disruption to help the UK minimise any potential impacts. Hopefully this event will pass without the majority of people noticing, but it’s important we monitor the risk.”

Since February 2011, the Met Office has been working with a range of partners, including the US National Oceanic and Atmospheric Administration (NOAA), the British Geological Survey (BGS) and the UK Space Agency to develop a UK-based space weather forecasting service.

This monitors the Sun’s activity and then predicts how these changes are likely to affect the Earth’s environment. The Met Office Hazard Centre currently has forecasters trained in space weather forecasting, and awareness is being raised across different industry sectors to make them aware of their potential vulnerability and how we can help lessen the risks.

In the event of a CME, space weather monitoring can provide anything from 17 hours to 3 days advance warning – allowing vital time to prepare.

Solar activity is currently expected to be high as we are near the peak of an 11-year solar cycle, which sees the Sun’s activity increase and decrease over the period.

You can see more about space weather forecasting in our Youtube video.

Date Created
May 2013

Update: Met Office keeping a close eye on space weather

Description

Updated on 20th May 2013

The recent activity on the Sun has now decreased back to levels we would normally expect at this point in time, close to a maximum of the 11-year solar cycle.

This follows a period where a sunspot, identified as 1748, emitted a number of powerful solar flares which were directed away from Earth.

There was a concern that another eruption from 1748 would be more directly aimed at Earth as it moved round with the Sun's rotation. However, 1748 has reduced in size and has seen no significant activity for more than 48 hours.

While the risk of impacts on Earth has decreased, it is still possible that high levels of activity will re-emerge from 1748 while it is facing Earth. The Met Office will continue to monitor the situation.

Mark Gibbs, Head of Space Weather at the Met Office, said: "This sunspot was particularly active last week, sending out one solar flare which was the largest measured for over a year. Fortunately its eruptions were not directed at Earth and we saw very minimal impacts.

"We have observed a decrease in the spot's activity in the past couple of days and, while a risk remains, we are now at a normal level of activity for this point in the solar cycle."

Previous updates:

Updated on 17th May 2013

As per our blog article published yesterday, the Met Office continues to closely monitor the Sun following a recent surge in its activity related to a sunspot (identified by the number 1748).

This morning saw a Coronal Mass Ejection (CME), which is an eruption of electromagnetically charged gas (plasma), from the sunspot. The CME is due to catch Earth with a glancing blow which is not expected to cause any significant impacts.

There remains a low risk through to the end of next week that we could see a CME from 1748 which is aimed more directly at Earth, but after that the risk is expected to diminish.

We'll continue to monitor the situation closely and provide updates if there are any changes.

Date Created
May 2013

Met Office predicts above average Atlantic hurricane season

Description

The Met Office Atlantic tropical storm forecast for 2013 is for 14 tropical storms between June and November, with a 70% chance that the number will be in the range 10 to 18.

The long-term average over the period 1980–2010 is 12 tropical storms. The last three hurricane seasons have all recorded above average tropical storm activity.

The most likely Accumulated Cyclone Energy (ACE) index — a measure of the strength and duration of storms over the season — is 130, with a 70% chance that the index will be in the range 76 to 184; the 1980–2010 average ACE index is 104.

For the first time this year, the Met Office are also releasing a forecast of the number of hurricanes (storms with winds of at least 74 mph), following the success of experimental forecasts produced throughout the 2012 hurricane season.

Between June and November 2013 the best estimate is for 9 hurricanes, with a 70% chance that the number will be in the range 4 to 14; the 1980–2010 average is 6 hurricanes.

Overall, these indicators point to a preference for above-average activity this year.

The evolution of the El Niño/La Niña cycle over the next few months is likely to play a large part in the North Atlantic hurricane season.

Joanne Camp, climate scientist at the Met Office, said: “El Niño conditions in the Pacific can hinder the development of tropical storms in the Atlantic whereas La Niña conditions can enhance tropical storm activity, so how these conditions develop will be important for the storm season ahead.”

The tropical storm forecast is produced using the Met Office’s new seasonal prediction system GloSea5. The model has higher resolution than its predecessor, with better representation of the complex physical processes that cause tropical storms and hurricanes. The forecast also uses information from the seasonal prediction system of the European Centre for Medium-Range Weather Forecasts (ECMWF).

For regular updates on tropical cyclones worldwide follow @metofficestorms on Twitter.

Date Created
May 2013

Guest Blog from the RAC: Ploughing on

Description

The RAC foundation has produced a report looking into winter resilience on the roads.

The report found that there was good preparation for the winter of 2012/2013 and that local highways authorities and councils were helped by generally good advance warning of the arrival of harsh weather. According to the report, “forecasting from the Met Office was to a high standard.” Also the majority of local highways authorities responded well to the snow and ice seen across much of the country earlier this year. There was no repeat of the salt shortages which helped create major disruption during the cold spells of winter 2009/10.

However the report said that as the climate appears to change we should not confuse extreme weather with rare weather, and if we continue to experience more frequent periods of inclement conditions then drivers will have to change their travel expectations and their view of what is ‘normal’.

Although there is evidence that more road users are taking notice of weather warning and being prepared, drivers need more advice on the potential benefits of winter tyres and ‘add-ons’ such as snow socks and snow chains. Drivers also need to be reminded of the importance of simple measures such as maintaining adequate tread depth on their normal tyres.

More information about Met Office weather warnings and for advice in what to do in severe weather you can visit the Met Office website.

Date Created
May 2013

What are tornadoes?

Description

They are spinning columns of air that reach the ground from cumulonimbus (thunderstorm) clouds.

Where do they occur and how do they form? – Most continents have regions with favourable conditions for tornado formation. The central and southern states of the USA have the most violent tornadoes in the world due to a unique combination of geographical and meteorological circumstances. This region, from Nebraska through Oklahoma to Texas, is known as 'Tornado Alley'. Here cold dry air moving south and east from the Rocky Mountains meets warm moist air from the Gulf of Mexico, giving perfect conditions for severe 'supercell' thunderstorms to develop. These thunderstorms can often produce tornadoes, especially in late spring and summer.

Tornadoes form as air starts to spin due to winds at different heights blowing at different speeds, creating wind shear. This causes the air to start spinning horizontally. If this gets caught in a supercell updraft, the updraft tightens the spin, speeds it up and tilts it towards the ground.

As tornadoes develop, funnel shaped clouds extend from the base of the cloud. It is only when these funnel clouds touch the ground that we get a tornado. If the funnel cloud touches down at sea we get a waterspout.

What happened this time? – Air masses have been colliding over the last few days. Unusually cool dry air from the Rocky Mountains and the northern plains, hot dry air from the desert and warm, humid air from the Gulf of Mexico have collided in a region stretching from Texas to Chicago, forming severe supercell thunderstorms and, in some instances, large tornadoes.

How severe was the tornado that hit Oklahoma? – It is virtually impossible to measure the speed of winds in tornadoes. Their strength is estimated by the amount of damage they cause. They are categorised using the Enhanced Fujita (EF) Scale of zero (weak) to five (strong). The tornado that hit Oklahoma yesterday is estimated to have been EF5 with winds of up to 200 mph. It was up to two miles wide and on the ground for 45 minutes. The tornado that hit Oklahoma yesterday was of a similar strength to the worst ever tornado to hit the area on 3 May 1999.

What about tornadoes in the UK? – It is claimed that the UK gets more tornadoes per square kilometre than the USA, but not more tornadoes in total. On average, around 30 tornadoes are reported each year in the UK. However, these are generally much weaker than their American counterparts.

How will climate change affect tornadoes? – It is currently not possible to make a link between climate change and tornado activity. Climate change may have a number of effects on atmospheric conditions that may or may not favour tornado formation, the relatively short and unreliable record of tornado activity makes it difficult to determine a definite trend in this. Climate models are currently unable to resolve small-scale phenomena such as tornadoes, and no models exist which can use climate model data to predict future tornado activity.

Met Office
What is a tornado?
Tornadoes form when the weather is 'unstable' and showery. They are narrow, spinning columns of air that reach the ground from cumulonimbus (thunderstorm) clouds.
As they develop we often see funnel shaped clouds extending from the base of the cloud and it is only where these funnel clouds touch the ground that we get a tornado. If the funnel cloud touches down at sea we get a waterspout.
Greatest distance travelled by a single tornado:
219 miles (352 km) from Ellington (Missouri) to Princeton (Indiana), USA on 18 March 1925.
Average annual number of tornadoes per state (1981–2010)
COLD, DRY AIR
WARM, MOIST AIR
Most tornadoes in a 24-hour period globally:
148 on 3 and 4 April 1974. These occurred across 13 states of the USA.
Most continents have regions with favourable conditions for tornado formation.
The central and southern US states see the most violent tornadoes in the world due to a unique combination of geographical and meteorological circumstances.
This region, from Nebraska to Texas and Oklahoma, has been named 'tornado alley'.
Here cold dry air moving south and east from the Rocky Mountains meets warm moist air from the Gulf of Mexico, giving perfect conditions for tornadoes to form, especially in late spring and summer.
Most tornadoes in a single calendar month:
758 during April 2011 in the USA.
Most tornadoes in a single year:
1820 in 2004 in the USA.
For more information please visit
www.metoffice.gov.uk
Produced by the Met Office
© Crown copyright 2013

Related articles

- How often do we have tornadoes in the UK?

Date Created
May 2013

Recent climate research in the news

Description

A research paper published in *Nature Geoscience* (Otto et al, 2013) led to a fair amount of media coverage yesterday, including articles in the Guardian, BBC and an opinion piece by Matt Ridley in The Times (this article is behind a pay wall).

The research paper looked at a 'best estimate' of the warming expected when the concentration of carbon in the atmosphere is doubled over pre-industrial levels (known as the Transient Climate Response).

Alexander Otto, Research Fellow in Climate Decisions at the Environmental Change Institute, University of Oxford, was the lead author of the research.

He has written an article discussing the science and the implications of the research which can be seen on the Research News pages on our website.

Here is a short extract from Alexander Otto's article :

"We published a paper in Nature Geoscience on Sunday giving a new best-estimate of 1.3°C for the Transient Climate Response, or the warming expected at the time carbon dioxide reaches double its pre-industrial concentration, using data from the most recent climate observations.

This best-estimate is lower than the HadGEM2 [one of the Met Office climate models] TCR value of 2.5°C and it is also 30% lower than the multi-model average of 1.8°C of the CMIP5 models used in the current IPCC assessment. Does this mean that the Met Office's advice to government is based on a flawed model? Certainly not.

It is well acknowledged by all that the HadGEM2 model is at the top end of the range of TCR values in CMIP5, but we need a diverse range of TCR values to represent the uncertainties in our understanding of climate system processes. And the Met Office's advice to government, like any solid policy advice, is based on the range of results from different models, not just their own.

…

The 'warming pause' over the recent decade does not show that climate change is not happening. And it certainly does not mean that climate scientists are "backing away" from our fundamental understanding.

Every new decade of data brings new information that helps reduce uncertainties in climate forecasts. In some ways, the picture changes surprisingly slowly for such an intensely scrutinised problem… This study highlights the importance of continued careful monitoring of the climate system, and also the dangers of over-interpreting any single decade's worth of data."

Date Created
May 2013

Spring on track to be coldest for 30 years

Description

Early figures from the Met Office show spring (March, April and May) 2013 is on course to be the coldest in the UK since 1979.

Estimates of the mean temperature for the whole season have been made based on data from 1 March up to 15 May as well as an assumption of average conditions through to the end of this month. The final figures could therefore be different, depending on the temperatures we actually see up to the end of May.

The estimates suggest the mean UK temperature for spring will be around 6.1 °C, which would make it the 6th coldest spring in national records dating back to 1910 and the coldest since 1979 when the mean temperature was 6.0 °C.

The estimated figure this year goes against recent form for spring, with eight of the past ten years being above the long-term (1981-2010) average for the season of 7.7 °C.

However, looking further back, the most recent colder spring of 1979 came in the middle of a long run, lasting from 1962 to 1989, of springs which were almost all colder than the current average*.

This year's particularly cold spring was heavily influenced by an exceptionally cold March which had a mean temperature 3.3 °C below the long-term average. April and May (so far) have been less cold, but have also registered slightly below average mean temperatures.

The colder than average conditions have been caused by frequent east and northerly winds which have brought cold air to the UK from polar and northern European regions.

This spring also looks to be slightly drier than average, with an estimate of about 214 mm of rain which would be roughly 90% of the average amount we would expect through the season. This isn't that notable when compared with the the springs of 2010 and 2011, which were much drier – notching up 79% and 70% of the average respectively.

Estimated provisional statistics for spring 2013

	UK	England	Wales	Scotland	NI
Mean temp (° C)	6.1	6.8	6.2	4.7	6.3
Diff from avg (° C)	-1.7	-1.7	-1.8	-1.6	-1.5
Coldest since:	1979	1962	1979	1979	1986
Rainfall (mm)	214	158	246	292	240
% of avg	89.8	87.3	84.3	92.3	99

*The Met Office operates 30-year climate averages which are updated every decade. Looking at the

30-year averages of 1961-90, 1971-2000 and the current climate averages of 1981-2010, you can see the average mean temperatures for spring have increased over that period. This means defining what is ‘below-average’ depends on which 30-year period is used. All references in this article use the current 1981-2010 climate averages.

30-year period	Average spring UK mean temperature
1961-1990	7.1 °C
1971-2000	7.4 °C
1981-2010	7.7 °C

Related articles

- April drier and colder than average
- Why was the start of Spring so cold?

Date Created

May 2013

NASA Space Apps Challenge – Global winners announced

Description

The NASA Space Apps Challenge winners have been announced and the T-10 challenge from the Met Office event in London has won the Most Inspiring Award.

The idea of T-10 was to create an app that could be used in space which would save astronauts time, whilst also connecting Earth and Space. T-10 is a prototype mobile application for use on the International Space Station. Astronauts can choose specific points of interest they wish to photograph, and T-10 will alert them shortly before the station is set to fly over that location if the current weather permits photography.

The app also can also alert astronauts to interesting weather phenomena and upload photos directly to Twitter, as well as alert Earth-based users when the ISS will fly overhead.
British astronaut Tim Peake tweeted “Congrats – great result. Means I shouldn’t ever miss a pic during my mission.”

The team’s next steps are to launch an earth app shortly which will feed data into the International Space Station Wave map.

Honourable mentions were also received for People of Soil in the Galactic Impact category, which was also worked on at the event in London. Two challenges from Exeter also had honourable mentions in the Best Use of Hardware category – Arduhack and Web Rover 1.

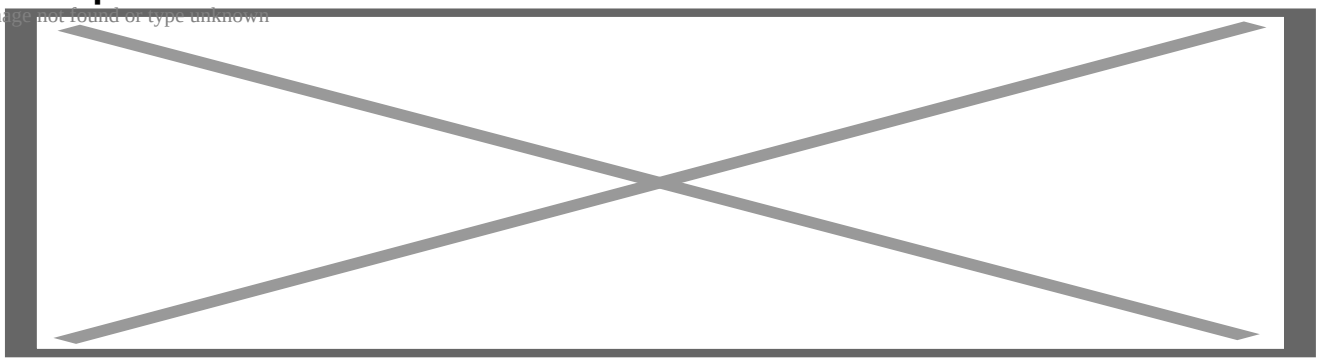
Some of the challenges were showcased at the Victoria and Albert Museum Digital Futures exhibition. Martin Roth, Director of the V&A said: “We are delighted to hear that T-10 have won a global award for their brilliant concept. The V&A seeks to inspire creativity and innovation and we are proud to have hosted T-10 and other teams involved in NASA’s International Space Apps Challenge at our Digital Futures event this week. It is great to see such ambitious collaborations between artists, designers and engineers help us understand the universe around us.”

Date Created
May 2013

How weather drives our herd mentality

Description

Image not found or type unknown



We all like to think of ourselves as individuals, making up our own minds what to do and when to do it.

But in Human Swarm, a new Channel 4 documentary, Jimmy Doherty reveals new evidence that suggests that in many ways we actually think and move like members of a herd of animals and that this swarm behaviour is driven by the powerful force of the weather.

The Met Office has the expertise and experience to combine the latest science with ground breaking advances in technology and local understanding to deliver operational advantage to our customers that can help businesses manage risks and opportunities as they arise from our weather and our collective behaviour.

The documentary reveals that one of the most powerful influences on each of us is the temperature, with the smallest changes affecting us physically and psychologically – without us even being aware of it – when the temperature drops, our appetite increases, our mood alters and our health suffers in many surprising – and surprisingly precise – ways.

This March was the coldest in fifty years, leading each of us to demand nearly 20% more gas and electricity than usual to heat our houses. And when 63 million of us are doing the same thing at the same time the effects multiply.

It's vital that energy suppliers have accurate weather forecasts to ensure enough electricity and gas is available immediately. The Met Office has one of the most powerful supercomputers in the world, capable of one hundred trillion calculations per second, which tracks temperature and weather data round the clock, providing detailed forecasts for the whole country, down to less than the nearest mile.

> Services for energy supply & demand

Our swarm behaviour continues when we leave our homes. When the temperature drops below 10 deg C we use 43% more fuel just in the first mile of journeys. The cold makes the oil thicker; the engine needs a richer mix of fuel and air; and colder air in the tyres reduces their pressure and causes more friction. Cold weather motoring adds up to an extra £1.4 billion to our annual fuel costs.

> Services for transport

We eat differently when it's cold too. Sales of porridge soar – Quaker Oats sell 200% more than normal, 20 million packets each week. Although we all make individual decisions about our breakfast, the overall result is that we act in a very similar way to a swarm.

Very small changes in temperature can have a profound effect on our health too. In December 2012, with the temperature regularly below freezing, visits to outpatients clinics shot up by 669,000 compared to the previous quarter. And analysis of 84,000 hospital admissions reveals that for each drop in the temperature of just one degree there were an additional 200 heart attacks.

> Services for health

Many businesses use the Met Office's weather and temperature forecasts to run their businesses effectively. Combined with their sales figures the results can be extraordinary – when temperature changes dramatically they know what we want to buy even before we do.

At Morrisons' 1.2 million square foot distribution centre in Yorkshire, the biggest in the UK, the supermarket's ordering system uses five years' sales and weather data to predict what we will want to eat and automatically select the right food to its stores.

Over this Easter weekend, the coldest on record, sales of pies were nearly 250% above normal. But, more surprisingly, cat litter sales were 15% higher, because our cats stayed inside. And sales of dishwasher salt went up by 138%, not because we have dirtier dishes, but because we think – completely wrongly – that it will clear our drives.

Likewise, when the temperature rises, we can be equally predictable. With three days of warmer weather, and the mercury hitting a 'magic' 18C, stores know we will all decide, quite independently, to have a BBQ. Within minutes of receiving a forecast of good weather, Morrisons divert from producing beef mince for casseroles to make burgers – distributing up to 1.2 million burgers per week, as well as the accompanying salad, buns and beer.

On weekend of April 20th this year, when the temperature reached 18C for the first time in 2013, online search for DIY items rose by 50% from the previous day and searches for mountain bikes doubled. There was also a 50% increases for the word 'pub' and a 54% rise in searches for tanning salons.

> Services for retail

"We are at the dawn of a data revolution – the amount we produce in our daily lives is increasing," says Jimmy Doherty. "I can totally understand why this can all seem a bit disturbing – that everything we do is now stored as data – but when all this information is matched with the weather data it really does increase our understanding of our behaviour – as a human swarm."

'Human Swarm' was broadcast at 9pm on Thursday 30 May 2013 on Channel 4 and is now available on 4oD catchup service

Date Created
May 2013

A response on statistical models and global temperature

Description

Over a period of several months the Met Office has been involved in dialogue and answered a series of questions on the subject of the use of statistical models in relation to the global temperature record.

The Met Office's Chief Scientist, Julia Slingo, has written a discussion paper on the subject – you can now view the Executive Summary and a link to the full paper in an article on our Research News pages.

Publication of this paper follows a guest article recently published on the Bishop Hill blog site, where one of the people with which the Met Office has been speaking with – Doug Keenan – makes a series of accusations about the Met Office and its science.

Professor Slingo's paper answers many of the points Mr Keenan makes, and the Met Office has already directly addressed many of the points Mr Keenan raises through considerable previous correspondence we have had with him on this issue. However, here we directly address a few of the key points in Mr Keenan's article:

1) Mr Keenan says that there is "no basis" for the claim that the increase in global temperatures since the late 1800s is too large to be reasonably attributed to natural random variation. He goes on to argue that this is because we haven't used the right statistical model.

However, the claim that the increase in global warming is larger than could be explained by natural variability has a clear and well understood grounding in fundamental physics and chemistry. There is very high confidence (using the IPCC's definition) that the global average net effect of human activities since 1850 has been one of warming. The basis for this claim is not, and never has been, the sole use of statistical models to emulate a global temperature trend. Instead it is based on hundreds of years of scientific advancement, supported by the development of high-quality observations and computational modeling.

2) Mr Keenan suggests that Met Office scientists have been 'trying to cover it [point 1, above] up'.

The Met Office has entered into email discussion at the working scientific level and responded promptly and transparently on all parliamentary matters and questions. We have also responded to numerous emails from Mr Keenan and invited him to come to the Met Office to discuss statistical modeling in climate science. As he points out in his article, so far those invitations have been declined or unanswered. The invitation still stands.

3) Mr Keenan then goes on to argue that you can only use a statistical model to determine whether the warming we have seen is *statistically* significant. He argues that the Met Office has used the wrong statistical model and, therefore, our science is flawed.

The study of climate variability and change is broader than the domain of statistics, most notably due to the importance of the underpinning science of the climate system. Our judgment that changes in

temperature since 1850 are driven by human activity is based on information not just from the global temperature trend, or statistics, but also our knowledge of the way that the climate system works, how it responds to global fossil fuel emissions and observations of a wide range of other indicators, such as sea ice, glacier mass, sea level rise, etc.

Using statistical tests in the absence of this other information is inappropriate, particularly when it is not possible to know, definitively, which is the most appropriate statistical model to use. In particular, a key test of an appropriate statistical model is that it agrees with everything we know about the system. Neither of the models discussed by Mr Keenan is adequate in this regard. On that basis, this conversation on statistical modelling is of little scientific merit.

4) Mr Keenan details his argument to say that various different statistical models can emulate the global temperature record better and worse than others.

This is something the Met Office has already spoken about and shown analysis on (such as in an answer to a parliamentary question (PQHL62)). However, this assessment of relative likelihood does not ensure that any of the statistical models are scientifically valid. Because the Met Office does not make an assessment of global warming solely on statistics – let alone the statistical models referred to in Mr Keenan's article, this exercise is of very little, if any, scientific use.

5) Mr Keenan also makes repeated accusations that the Met Office did not, or was not willing to respond to Parliamentary Questions.

This is not the case. The Met Office answered every request for input to Parliamentary Questions and answered them in the most scientifically appropriate way to the best of its knowledge. There has never been a refusal to provide information to answer a Parliamentary Question.

Date Created
May 2013